SANITARY SURVEYS: FACILITY SURVEYS

LA DHH/OPH

Purpose of Sanitary Surveys

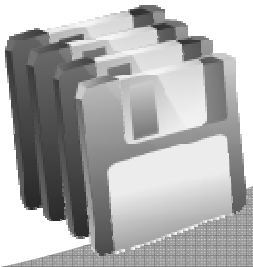
- Determine a public water supply's ability to maintain a continuous supply of safe drinking water to the consuming public

Survey Types

- Sanitary Survey
- Enforcement Survey
- Physical Inspection – Site Visit
- Capacity Development
- Engineering Survey

Sanitary Survey

- A complete fact finding, information gathering and physical inspection of a public water supply
- Referred to as a Class I Sanitary Survey



Enforcement Survey

- Can be requested by the State or EPA
- A Class I Sanitary Survey conducted in response to an uncorrected significant deficiency, violation, or a series of violations
- Post Order Investigation is conducted after the violation(s) or significant deficiency has been corrected by the water system

Physical Inspection

- An information gathering and inspection tour of the physical facilities of a water supply only
- Referred to a Class II Sanitary Survey

Capacity Development

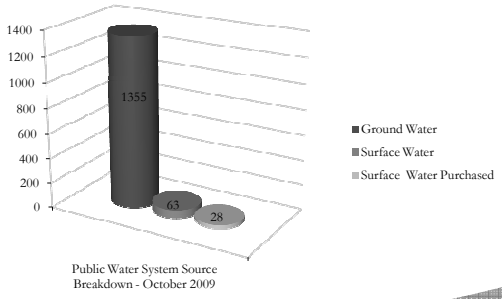
- A physical inspection and fact finding tour of a water system supply's facilities in order to make financial and managerial recommendations or findings
- Looks more at income/expense records and managerial procedures
- State Revolving Fund (SRF) Department
  - Low -interest loan program

Engineering Survey

- A physical inspection and fact finding tour of a water system supply's facilities in order to make engineering recommendations or findings

Sanitary Survey Frequency

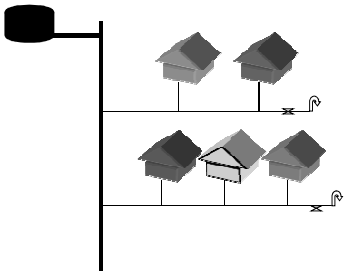
- Surface Water – Every year
- Ground Water Under the Influence – Every year
- Ground Water Systems – Every 3 years



Public Water System Source Breakdown - October 2009

Community

- 15 service connection – year round residents
- Serves at least 25 people



Non-Transient/Non-Community

- Public water system
- Regularly serves at least 25 of the same people, non-residents, over 6 months per year

Transient Non-Community

- Public water system
- Does not meet criteria for community supply
- Serves at least 25 different people at least 60 days per year

8 Elements-Class I Sanitary Survey

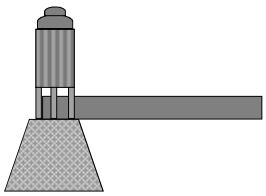
1) Source
2) Treatment
3) Distribution system
4) Finished water storage
5) Pumps, pump facilities & controls
6) Monitoring, reporting, & data verification
7) Water system management and operation
8) Operator compliance with State requirements

1) Sources – Four types

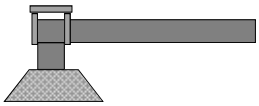
- Well
- Surface intake
- Well under direct influence
- Purchased

Type of Wells

- Vertical turbine

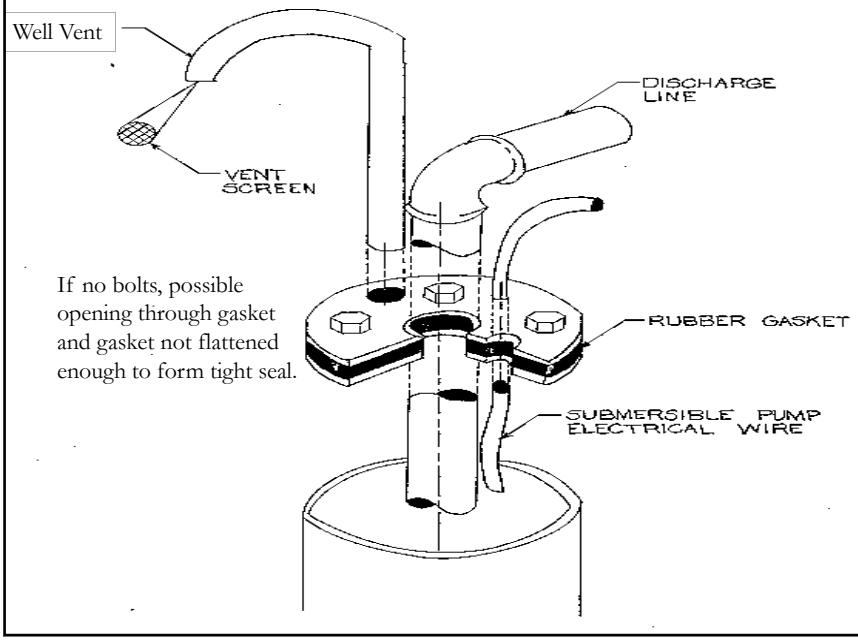


- Submersible

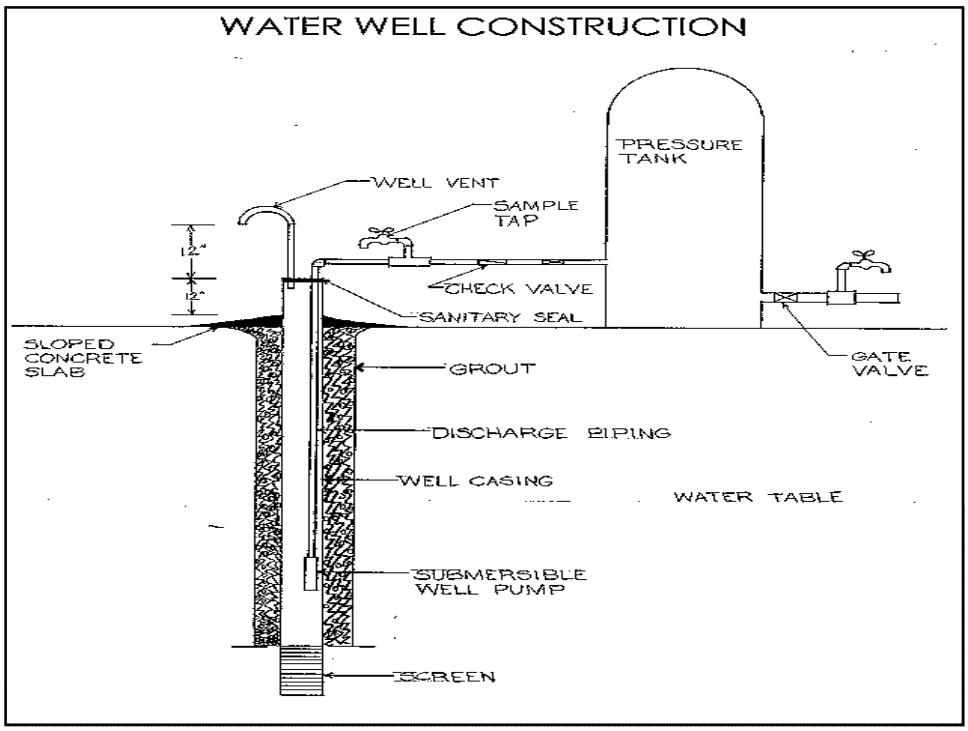


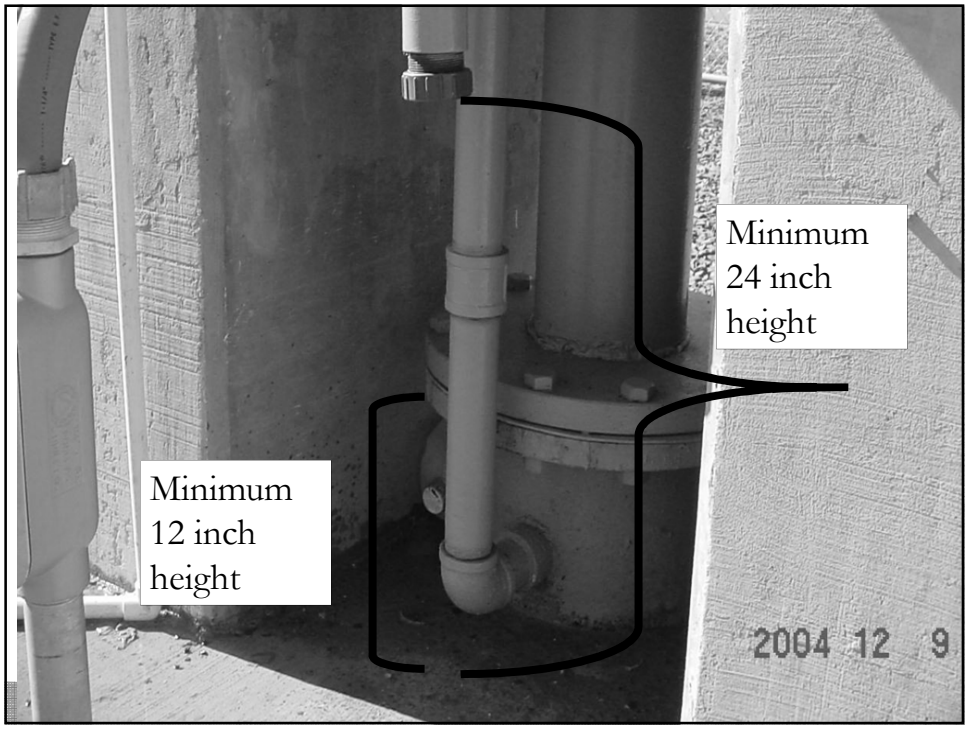
- Artesian – "free flowing"

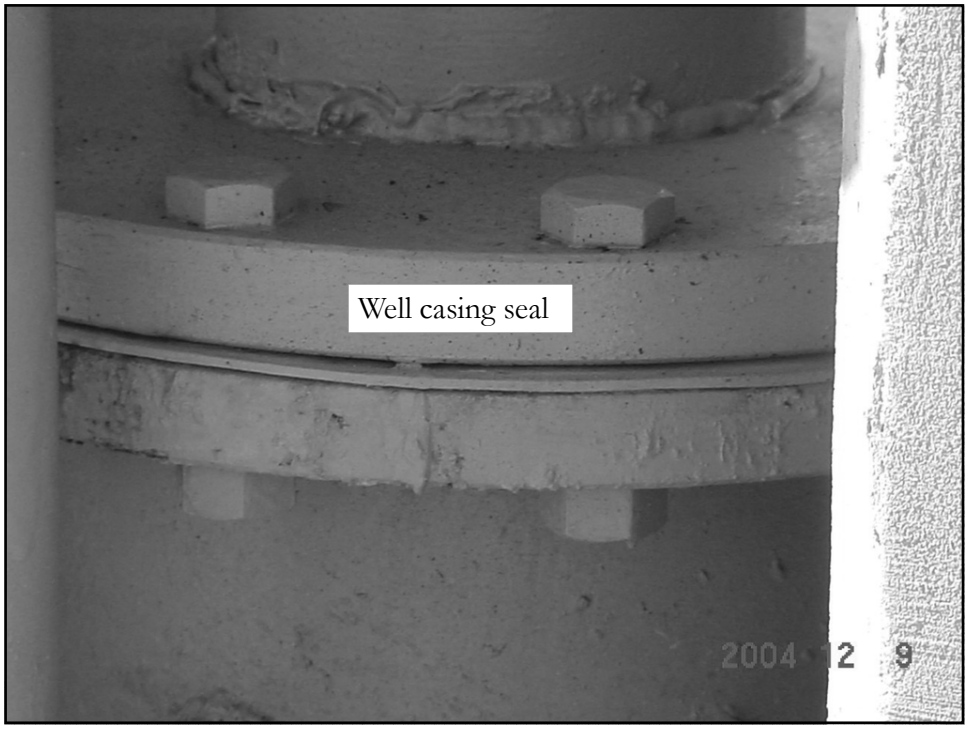
Well Seal for a Submersible Pump

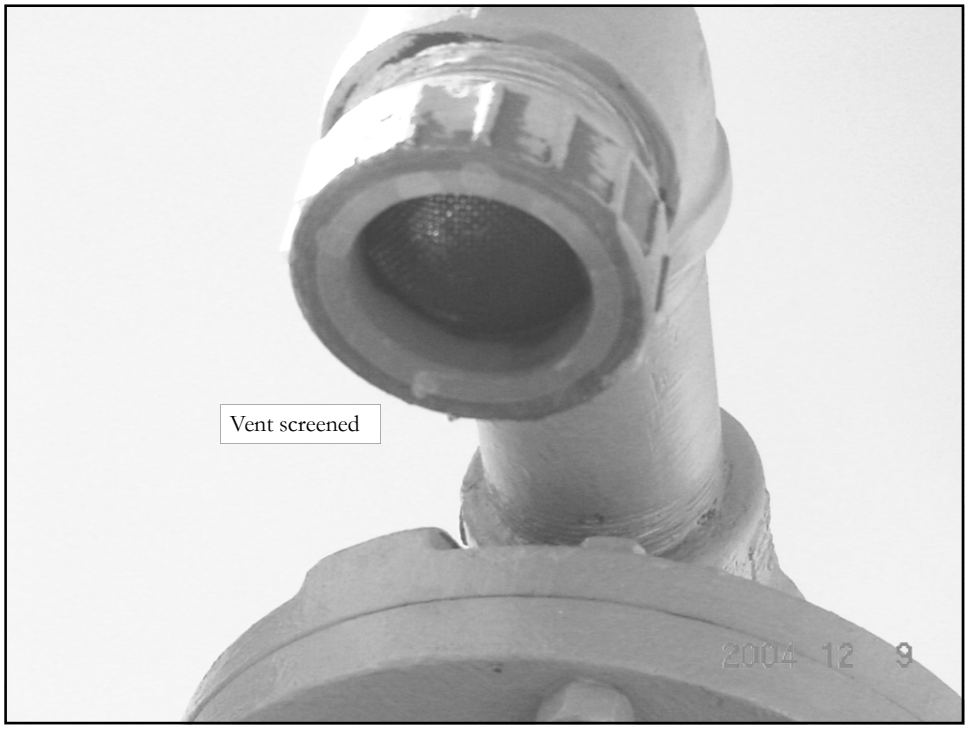


If no bolts, possible opening through gasket and gasket not flattened enough to form tight seal.

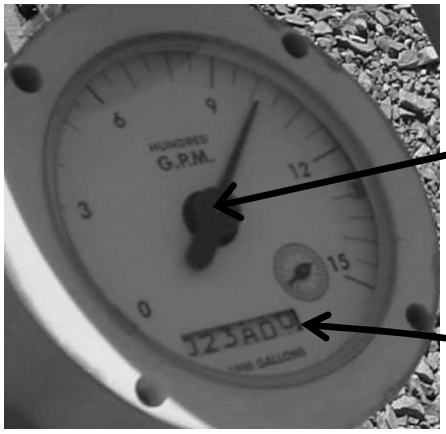

WATER WELL CONSTRUCTION
PRESSURE TANK
WELL VENT
SAMPLE TAP
CHECK VALVE
SANITARY SEAL
SLOPED CONCRETE SLAB
GROUT
GATE VALVE
DISCHARGE PIPING
WELL CASING
WATER TABLE
SUBMERSIBLE WELL PUMP
SCREEN


Minimum 24 inch height
Minimum 12 inch height
2004 12 9


Well casing seal
2004 12 9

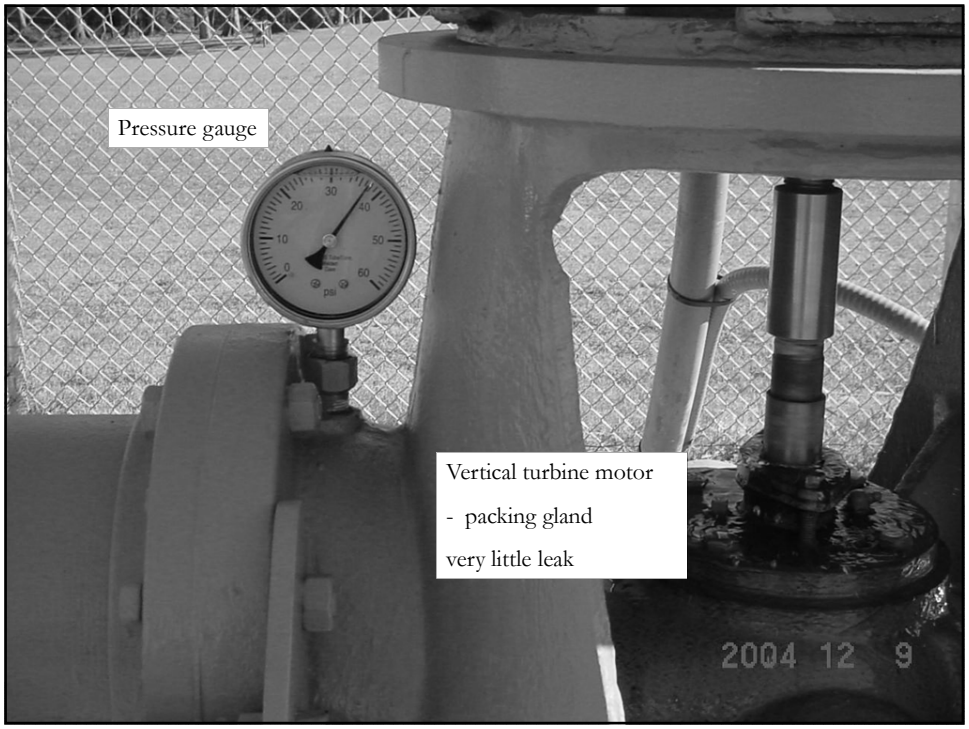

Vent screened
2004 12 9

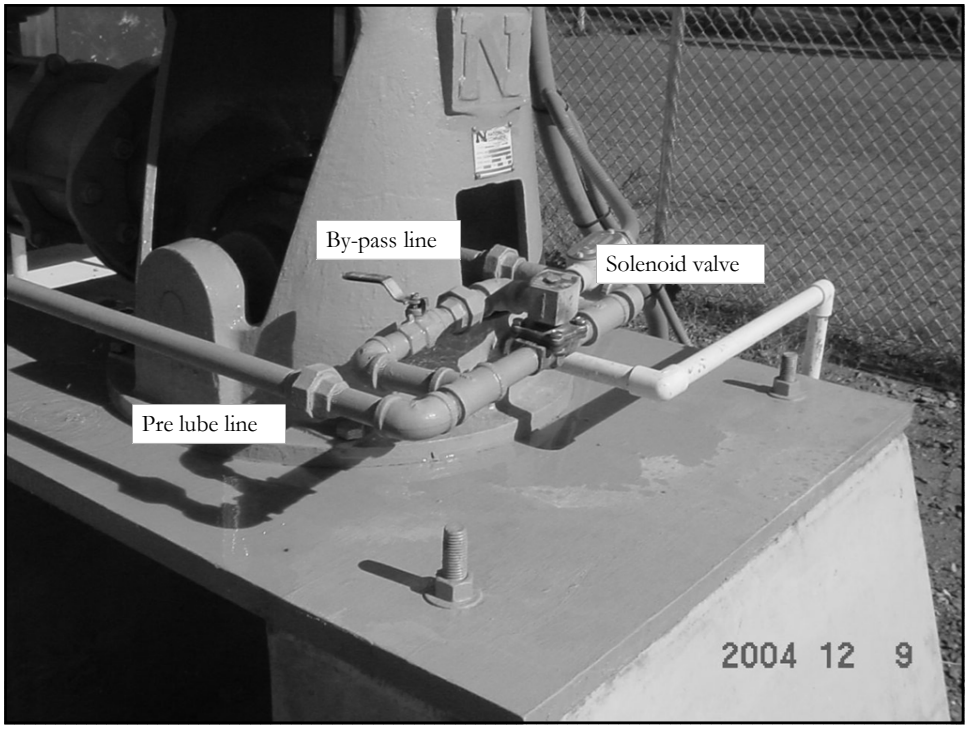
Flow Meter



Indicating – flow rate

Totalizer – number of gallons per day





Raw Water Collection Point

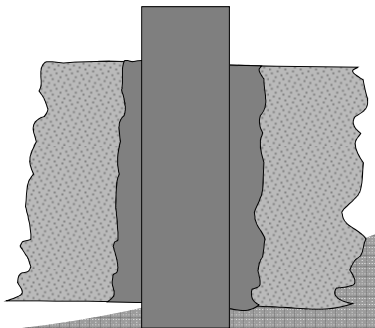
- Smooth nozzle tap
- Installed prior to the required check valve
- Primary Drinking Water Regulations

Well Review

- Well log and characteristics
  - Flow and well yield
  - Depth
  - Material
- Aquifer protection
  - Sanitary seal
  - Secure casing
  - Grouting
- Security
  - Fencing, locks, *etc.*
  - Contamination
- Proper well construction
- Well Maintenance
  - Casing condition
  - Site maintenance

Grouting Of Wells

The Annular Space Between The Well Casing And The Bore Hole Shall Be Sealed With Cement-Bentonite Slurry Or Neat Cement.



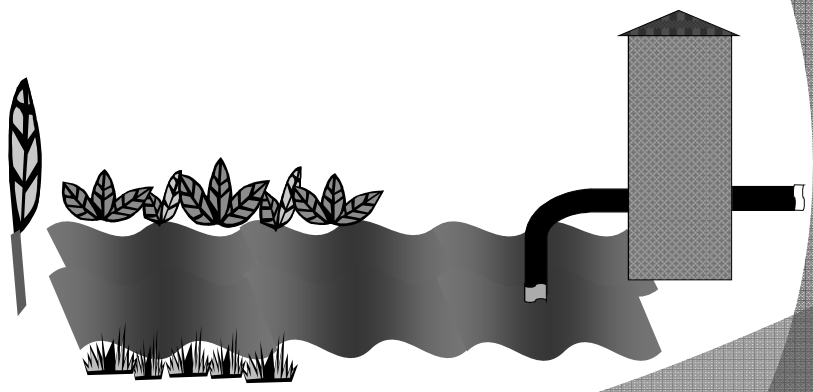

Oil and gas – potential contamination
No fence
No concrete slab around
Where is the sewer system?
Water standing close to well


Cluttered.
Hazardous.
Casing
condition

Four Types of Sources

- Well
- Surface intake
- Well under direct influence
- Purchased

Surface Water Intake



Source Information

- Water body (flowing vs. not-flowing)
- Basic make-up of the water
  - Turbidity
  - pH
- Pumps
  - How many?
  - Types
  - Capacity

Intake Pipe

- Where is Intake
  - Near shore or middle of reservoir
  - Near surface or bottom of reservoir
  - Multiple intakes
- Is Pipe Screened
  - Intake pipe screened
  - Area around pipe screened
- Where are sources of contamination

Pumping Facilities at Intake

- Fenced / Protected
- Operator accessibility
- Pumping Equipment
- Maintained

Four Types of Sources

- Well
- Surface intake
- Well under direct influence
- Purchased

Purchase

- Master Meter where connected to Seller
- Booster pumps
- Post treatment (chlorination boost)
- Storage
- Written contract with Seller
- **Operator certified Production and Distribution**

2) Treatment

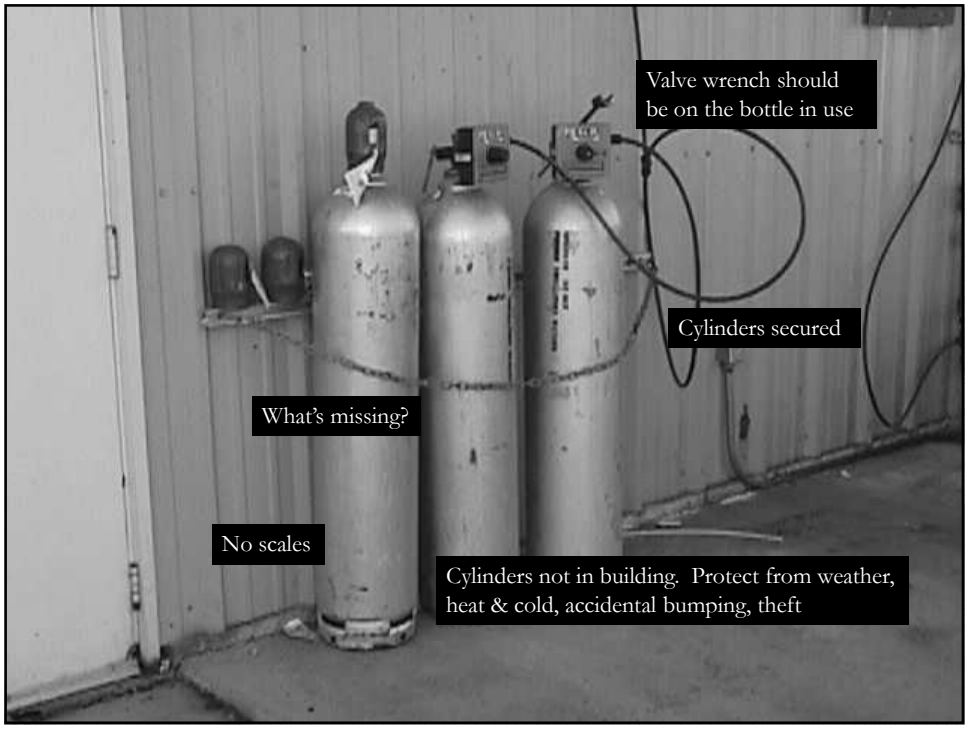
Records

- Amount of chemicals used
- Which chemicals used
- Injection rates
- Amount of water treated
- Water quality before and after treatment
- Flow rate through plant
- Diary of all procedures used
- Any unusual incidences

Chlorine Residual Reports

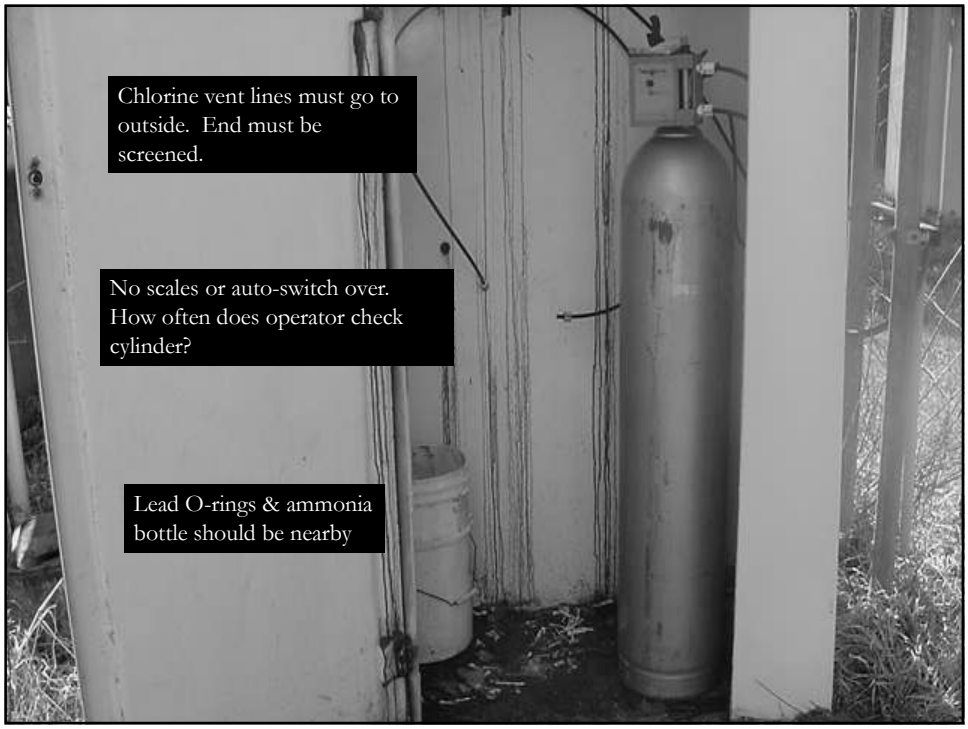
- Free chlorine residual tested every day: weekends, holidays, vacations, etc.
- Daily residuals kept on approved form
- Maximum chlorine residual tested monthly with Routine bacteriological samples.

Chemical Addition (Chlorination)

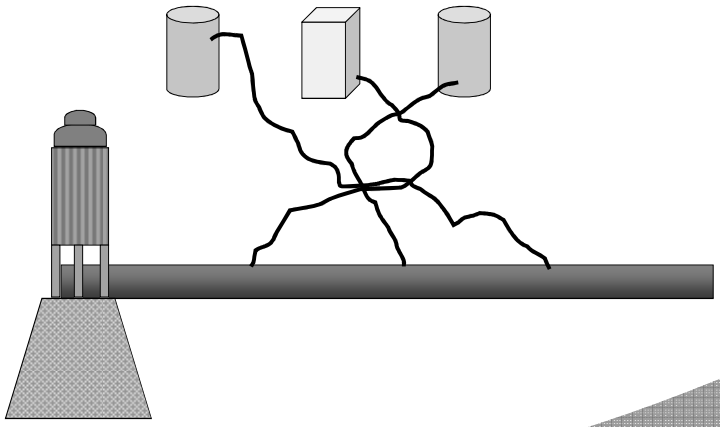

Valve wrench should be on the bottle in use
Cylinders secured
What's missing?
No scales
Cylinders not in building. Protect from weather, heat & cold, accidental bumping, theft


DANGER
CHLORINE
RESERVE
01/31/2007


Hypochlorite solution. Unprotected from weather. Not secure.
Chemical feed pump


Chlorine vent lines must go to outside. End must be screened.
No scales or auto-switch over. How often does operator check cylinder?
Lead O-rings & ammonia bottle should be nearby

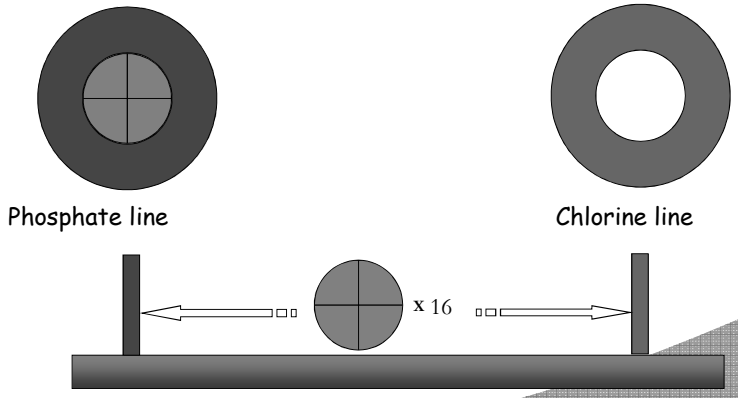
What Goes Where? When?



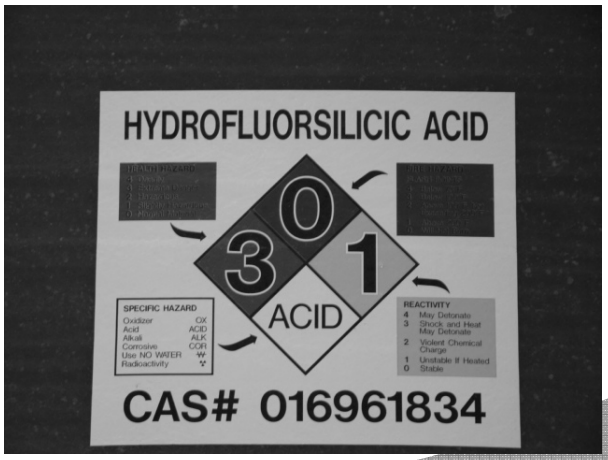
Phosphates and Chlorine

- Orthophosphates and polyphosphates are to be injected prior to the chlorine injection site. The phosphate injection site is to be a minimum of sixteen times the inside diameter of the phosphate feed line ahead of the chlorine injection site.

Phosphate and Chlorine



Chemical Labels

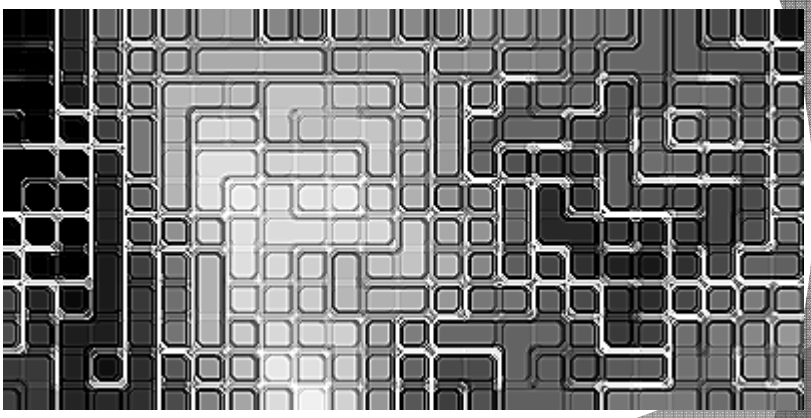


Pipe Labels

Chemicals and Pumps

- Are they compatible?

3) Distribution



Records

- Pipe sizes
  - Plan documents
  - Locations
- Distribution components
  - Valves (Gate, Flush, *etc.*)
  - Fire Hydrants
  - Sample Taps
  - Dead-ends
- Pipe Material
  - Asbestos Cement
  - PVC (poly-vinyl chloride)
  - PE (poly ethylene)
  - Cement
- Data
  - Chemical data (Chlorine)
  - Pressure data

Distribution Review

- Maintain proper pressure and flow
  - The minimum for the State is 15 psi
  - Maintain adequate flow to reduce buildup in pipes
- Elevations
  - Pressure inversely proportional to Elevation
  - If terrain varies greatly, test psi at highest / lowest areas served.
- Flushing Program

POC Sample Site Plan

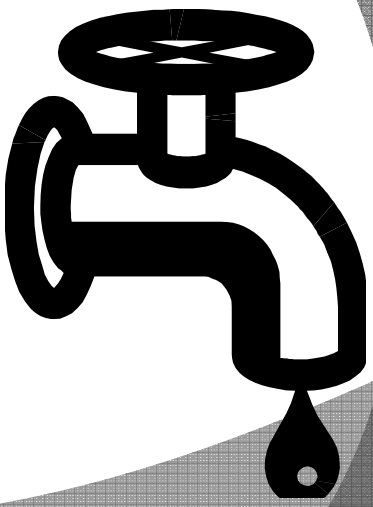
Point of Collection

Bacteriological (Bact.) Sample Sites

D/DBP Plans

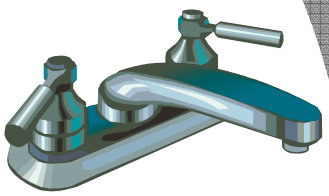
Sample Taps

- Source of your bact. samples
- Choose sites wisely
- Secure sites
- Maintain the sample taps



Unapproved Sample Taps

- Swing-neck tap
- Mixing faucets
- Vacuum breakers
- Leaking faucets
- Fire hydrants/flush valves
- Upstream of treatment devices



Approved Sample Taps

- **Smooth-Nozzle tap**
- **12 inches above any surface**
- **Located away from potential exterior contamination**

Cross-Connections

A connection between a supervised potable water supply and an unsupervised supply of unknown quality

Cross Connection Protection

- **Back flow**
- **Back Siphonage**
- **Back pressure**

1. **Air Gap**
2. **Reduced Pressure Principle**

Backflow Preventers

3. **Double Check Valve Assembly**
4. **Atmospheric Vacuum Breakers**

Likely Places For Cross Connections

- **Hospitals and Medical Bldg**
- **Mortuaries and Morgues**
- **Sanitariums and Nursing Homes**
- **Laundries and Dye Works**
- **Waste Water Treatment Plants**

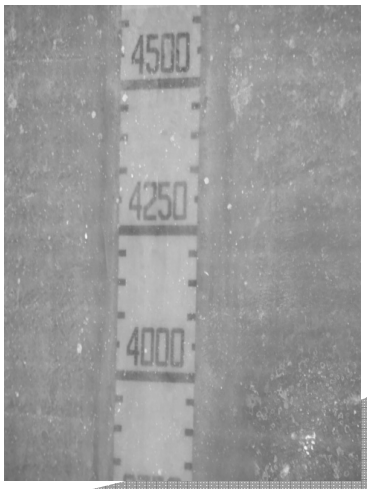
Cross Connection Protection

- **Back-flow and back siphonage protection devices shall be tested annually**
  - **Louisiana licensed plumber certified in BFP device testing**
  - **Records of the results of the testing shall be kept by the water system**
- **Components shall not be placed below grade**

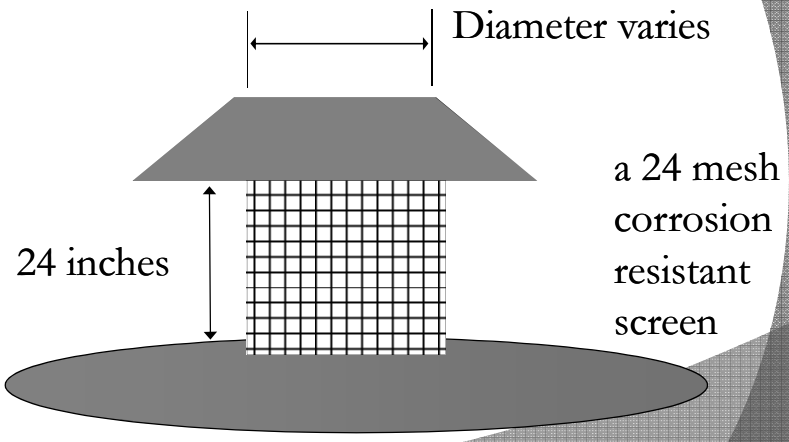
4) Finished Water Storage

Storage tanks

- Capacity -usable volume
  - Overflow
  - External gauge
  - SCADA system
- Maintenance & Structural Integrity
- Material and painting (internal & external)
- Site Security

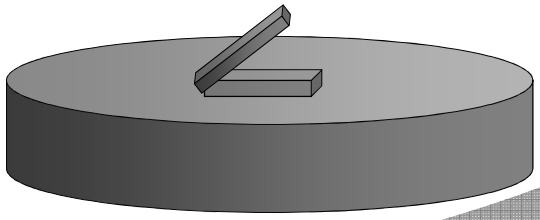


Tank Vent



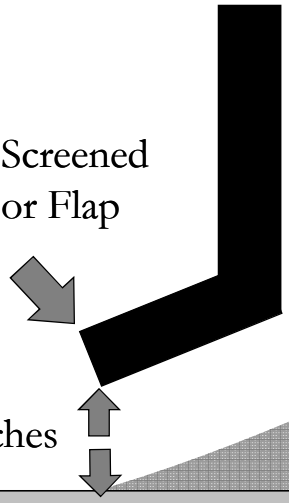
Manhole Secured

- Shall be fitted with a solid watertight cover which overlaps the framed opening and extends down around the frame at least 2 inches
- Shall have a locking device



Tank Overflow

Recommended that overflow diameter be one size larger than inlet and outlet of the tank.



Hydropneumatic Tank

- Hydropneumatic tanks combine energy from a pump with the principle of air pressure to force water into the distribution system.
- Not recommended for fire protection
- Size limits number of customers you can serve

Hydropneumatic Tank

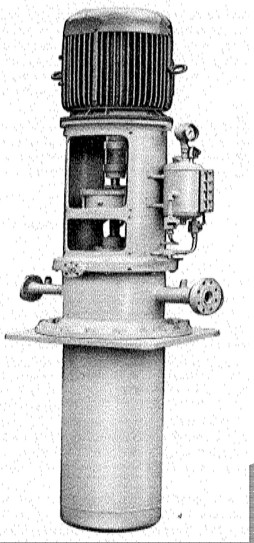
- Cut-in Pressure vs. Cut-out Pressure
- Cycle Repeats
- Air:Water = 1/3 air to 2/3 water
- Cycle Rate - Number of times the pump starts and stops in one (1) hour
- Sight tube
  - **Protect from freezing**
  - **Clean, not clogged**

5) Pumps, Pump Facilities & Controls

- Intake
- Transfer
- Service
- Booster
- Chemical Feed

Pump Types

- Centrifugal
- Hand pump
- Jet pump
- Positive Displacement
- Submersible
- Vertical Turbine



Pump Information

- Horsepower and capacity
- Lubrication used
  - Food grade oil
- System demands
- Rule of Thumb – pumps are being overworked if they work more than 10 hours per day

Generators

6) Monitoring, Reporting, & Data Verification

- Chemical Data
  - Organic Data
  - Inorganic Data
- Radiological Data
- Lead and Copper
- D/DBP
- Total Coliform Rule
- CCR
- LAC 51:XII
- Variances
- Plans Current
- Inspection Reports
- Violation
  - Actions to Correct Violations
  - Public Notification Verification
- Responses
- Chlorine Residual Reports
- Calibration Tests
- Backflow Device Test Results
- Chlorine Dioxide Residuals

Record Keeping

- Chlorine Residuals - 3 years

Record Keeping

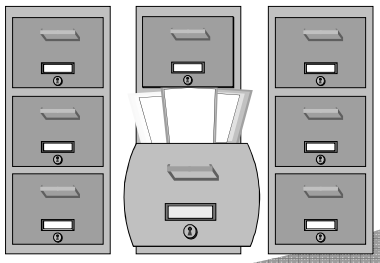
- Bacteriological Results - 5 years

Record Keeping

- Chemical Analysis - 10 years
- Chemicals used for treatment

Record Keeping

- Your Lab Reports - 10 years
  - Iron / Manganese Removal
  - pH / Corrosion Control
  - Surface Water Treatment Rule



Record Keeping

- General Correspondence - 10 years
- Survey Letters, Plans Approvals
- Requests For Information
- Your Letters to DHH

7) Water System Management and Operation

- Administrative Contacts
  - Owner / President / Mayor
  - Boardmembers / Aldermen
- Contact information
- Has any attended management class?

Amend Contact Info

- Update legal contacts
  - Addresses
  - Phone numbers
- Update population
- Water system capacity
  - Flow
  - Storage
- Contacts
  - Administrative contact
  - Designated operator
  - Certified operator
  - Legal contact
  - Emergency contact

8) Operator Compliance with State Requirements

Operator Certification

- Knowledgeable
- Certified
- Sufficient number to maintain system
- Contact information

Electronic Sanitary Surveys

- Allows the State to more effectively track minor and significant deficiencies identified during the Sanitary Survey
- Allows the State to maintain schedules for follow-up activities
- Allows State to provide a more uniform approach to conducting surveys across Louisiana
  - Required fields
  - Better reporting to the system

Engineering Services

Metro Region I – New Orleans
504-599-0101

Capitol Region II – Baton Rouge
225-925-7230

Teche Region III – Thibodaux
985-447-0920

Acadian Region IV – Lafayette
337-262-5311

Southwest Region V – Lake Charles
337-475-3200

Central Region VI – Alexandria
318-487-5262

Northwest Region VII – Shreveport
318-676-7470

Northeast Region VIII – Monroe
318-361-7201

Southeast Region IX - Mandeville
985-871-1300

Ask for Engineering Services